

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

**Stephen R. Forrest, Milind R. Gokhale
and Pavel Studenkov**

Serial No.: Not Yet Assigned

Group Art Unit: Not Yet Assigned

Filed: Herewith

Examiner: Not Yet Assigned

For: **TWIN WAVEGUIDE BASED DESIGN FOR PHOTONIC
INTEGRATED CIRCUITS**

I, John E. McGlynn, Registration No. 42,863 certify that this correspondence is being deposited with the U.S. Postal Service as First Class mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

On October 18, 2007

John E. McGlynn Registration No. 42,863

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

PRELIMINARY AMENDMENT

Please amend this application as follows:

In the Claims:

Please delete claims 1 through 40. Please add claims 41 through 67 as follows:

41. A monolithically integrated device having at least a first mode of light and second mode of light propagating therein, comprising:
a first waveguide; and

a second waveguide coupled to said first waveguide, said second waveguide having a lateral taper formed therein for guiding light between said first waveguide and said second waveguide;

wherein the first mode of light and the second mode of light are divided unequally between said first waveguide and said second waveguide.

42. The device according to claim 41 wherein the first mode of light is primarily confined to said first waveguide and the second mode of light is primarily confined to said second waveguide.

43. The device of claim 41, wherein said lateral taper has an exponential curve.

44. The device of claim 41, wherein said first waveguide and said second waveguide have different effective indices of refraction.

45. The device of claim 41, wherein said second waveguide comprises an active region for amplifying light propagating therein.

46. The device of claim 42, wherein said second waveguide comprises an active region for amplifying light propagating therein and said second mode of light experiences higher gain than the first mode of light.

47. The device of claim 44, wherein said second waveguide has a higher effective index of refraction than said first waveguide.

48. The device of claim 41, further comprising a substrate.

49. The device of claim 41, wherein said device comprises a laser.

50. The device of claim 49, wherein said laser comprises at least one quantum well.

51. The device of claim 41, wherein at least one of said first waveguide and said second waveguide comprises a grating region for reflecting selected frequencies of light.

52. The device of claim 41, wherein said second waveguide is positioned vertically relative to said first waveguide.

53. The device of claim 41, wherein said device comprises at least one of the following: an optical detector and an optical amplifier.

54. The device of claim 41, wherein said device is a photonic integrated circuit.

55. A photonic device, comprising:
at least a first waveguide and a second waveguide, wherein one of said first
waveguide and said second waveguide comprise a lateral taper for guiding light between
said first waveguide and said second waveguide, and wherein said first waveguide and
said second waveguide have different effective indices of refraction.

56. The device according to claim 55, wherein at least a first mode of light and a second mode of light propagate in said device, and wherein the first mode of light is primarily confined to said first waveguide and the second mode of light is primarily confined to said second waveguide.

57. The device of claim 55, wherein said lateral taper has an exponential curve.

58. The device of claim 55, wherein said second waveguide comprises an active region for amplifying light propagating therein.

59. The device of claim 56, wherein said second waveguide comprises an active region for amplifying light propagating therein and the second mode of light experiences higher gain than the first mode of light.

60. The device of claim 55, wherein said second waveguide has a higher effective index of refraction than said first waveguide.

61. The device of claim 60, wherein said second waveguide is positioned vertically on top of said first waveguide.

62. The device of claim 55, further comprising a substrate.

63. The device of claim 55, wherein said device comprises a laser.

64. The device of claim 63, wherein said laser comprises at least one quantum well.

65. The device of claim 55, wherein at least one of said first waveguide and said second waveguide comprise a grating for reflecting selected frequencies of light.

66. The device of claim 55, wherein said device comprises at least one of the following: an optical amplifier and an optical detector.

67. The device of claim 55, wherein said device is a photonic integrated circuit.

REMARKS

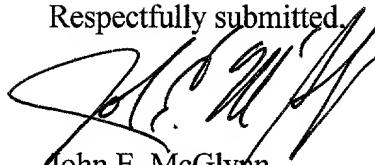
The purpose of this amendment is to place the application claims in condition for examination.

An expedient and favorable first office action is respectfully solicited.

DOCKET NO.: PUAS-0016

PATENT

Respectfully submitted,



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Date: 10/18/01

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